

Sense and Respond Logistics: The Future of Marine Corps Combat Service Support

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Sense and Respond Logistics:  
The Future of Marine Corps Combat Service Support  
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*Throughout the struggle it was in his logistics inability to maintain his armies in the field that the enemy's fatal weakness lay. Courage his forces had in full measure, but courage was not enough. Reinforcements failed to arrive, weapons, ammunition and food alike ran short and the dearth of fuel caused their powers of tactical mobility to dwindle to the vanishing point. In the last states of the campaign they could do little more than wait for the Allied advance to sweep over them.*<sup>1</sup>

This quote from Dwight Eisenhower, referencing the Axis Powers of World War II, illustrates the importance of logistics in military campaigns and how the lack of effective logistics can result in strategic, operational and tactical failure. Logistics capability has evolved considerably over time and has become, arguably, the most important of the six warfighting functions "command and control, fires, maneuver, intelligence, force protection and logistics."<sup>2</sup> Because logistics provides the other five functions what they need to exist and operate successfully, logistics must be considered in the forefront.

For the past 230 years, the Marine Corps has distinguished itself as the world's premier amphibious force with the ability to deploy anywhere in the world in less than seven days. More recently, the global war on terrorism has required that this ability be "broadened to decisively defeat growing and diverse

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<sup>1</sup> Marine Corps Doctrinal Publication 4, *Logistics* (February 1997) p. 1.

<sup>2</sup> Marine Corps Doctrinal Publication 1-0, *Marine Corps Operations* (September 2001) p. 3-14.

threats.”<sup>3</sup> Because of this realization, Sense and Respond Logistics is the only tool that can effectively support the Marine Corps’ expeditionary capability in the future.

Sense and Respond Logistics is a concept that will revolutionize the supply chain and move the Marine Corps and the Department of Defense (DoD) away from the classic forms of logistics. It will do this by leaning heavily on an information technology network that will connect all of the units in a specific theater. Within the network each unit, or node, will be able to act as both a consumer and a supplier. The classic forms of logistics, to be touched on later, have served the Corps and the DoD well but the changing battle-space will render them obsolete.

### **Logistics Evolution**

Doctrinally, logistics is defined as “the science of planning and carrying out the movement and maintenance of forces.”<sup>4</sup> Historically, that definition was characterized by iron-mountains of supplies. This mass-based logistics system “involves stocking a large inventory of parts and supplies that may be required to satisfy mission requirements.”<sup>5</sup> The idea behind the iron-mountain, mass-based system, is to have within

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<sup>3</sup> U.S. Marine Corps Concepts and Programs, (2005), 2.

<sup>4</sup> MCDP 4, 3.

<sup>5</sup> Laurel K. Myers, “Eliminating the Iron Mountain,” *Army Logistician*, July-August 2004, [http://www.almc.army.mil/alog/issues/JulAug04/C\\_iron.html](http://www.almc.army.mil/alog/issues/JulAug04/C_iron.html), Accessed, 13 November, 2005.

the theater of operations, any part that may be needed, thereby reducing the length of time required to obtain parts and supplies when they are requested by the user. Its measure of effectiveness is based on the supported forces ability to place large amounts of equipment in country. This form of logistics was used to support troops deployed to Kuwait during Operations Desert Shield and Desert Storm. In his book "Moving Mountains", Lieutenant General William G. Pagonis, Commanding General of the 22d Support Command, noted that:

...during the reception phase of Desert Shield, the traffic flowing through the ports of Saudi Arabia totaled 12,400 tracked vehicles, 114,000 wheeled vehicles, 1,800 Army aircraft, 33,000 containers, 1,800,000 tons of cargo, 273,000 tons of ammunition, and more than 350,000 personnel.<sup>6</sup>

Since the massed based system's measure of effectiveness is based on the amount of equipment in country, the situation set forth by Lieutenant General Pagonis clearly illustrates the capabilities of the iron mountain. However, Lieutenant General Pagonis goes on to recount that:

Losses of container documentation multiplied the number of transportation personnel needed to channel containers to the correct deploying units. Such delays lengthened the waits by units to receive their supplies. Many containers languished in the staging area while awaiting identification to determine the appropriate receiving unit.<sup>7</sup>

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<sup>6</sup> Myers.

<sup>7</sup> Myers.

This quote illustrates the major disadvantage of mass-based logistics in that it requires a robust logistics force and, in the mass, items are easily lost and/or misplaced. For example, during Operation Desert Storm, there were instances when units received parts they ordered while deployed after they returned to the continental United States. While mass-based logistics works when the supported unit is in one set location, it is not compatible with an evolving battle-space. Consequently, evolution was necessary.

The logistics and supply chain concept that followed was called Just-in-Time (JIT) logistics. JIT is defined as "an inventory control system that controls material flow into assembly and manufacturing plants by coordinating demand and supply to the point where desired materials arrive just in time for use."<sup>8</sup> This concept and practice was first put into practice in Japan and has developed into an important part of the global supply system.<sup>9</sup>

This concept removes the military supply system from the replenishment chain and allows the consumer to order and receive parts directly from the supplier. Those parts are then delivered directly to the consumer "just-in-time," and the military supply system as the middle-man is removed from the

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<sup>8</sup> inboundlogistics.com, Glossary (letter J), <http://www.inboundlogistics.com/glossary/j.shtml>, Accessed 13 November, 2005.

<sup>9</sup> Joseph Sussman, *Introduction To Transportation Systems*, (Boston: Artech House Inc. 2000), 161.

chain. The supplier does not have to be in the same theater or hemisphere as the consumer. The system's measure of effectiveness is customer satisfaction, the hallmark of most civilian supply chains. The supplier is driven to meet the exact needs of the customer and will continually monitor and optimize the supply-chain in an effort to do so.

Within the JIT system, commercial parcel carriers are employed to make deliveries. Competition within the industry ensures that packages will be delivered on-time. The Army successfully used this concept in "Bosnia to deliver critically needed supplies, particularly during the [static] buildup phase of that operation."<sup>10</sup> Because the supplier does not have to be in the same operational theater or hemisphere as the consumer, the application of this concept can significantly cut down on the logistics footprint required in-country.

The major disadvantage of this system is that it requires both ends of the supply-chain (supplier and consumer) to be relatively static. While this may not pose a problem in the civilian sector, it becomes problematic when applied to a dynamic battle space. For example, a unit that orders an alternator while in Kuwait might be in Northern Iraq the next day and further west the following day. As a result, the part chases the unit around the battle-space and does not arrive when

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<sup>10</sup> Myers.

it is needed most. Unfortunately, although the just-in-time theory attempts to prevent uncertainty by predicting and optimizing inventory and delivery, the non-linear battle-space does not allow for the successful application of this theory.

### **The Future of Logistics**

It is clear that neither of the above-illustrated logistics support concepts truly serve the needs of units working in a non-linear battle space. Because there is no true rear area, units that operate in this environment must be mobile. As a result, neither mass-based nor JIT logistics practices are able to meet current logistics support needs. The mass based theory, in application, uses large amounts of inventory as a preventive measure against uncertainty.<sup>11</sup> The just-in-time theory attempts to prevent uncertainty by "predicting and optimizing inventory and delivery."<sup>12</sup> According to the U.S. Marine Corps' 2005 Concepts and Programs manual, future operations "...require an adaptable, flexible, and responsive logistics system."<sup>13</sup> Because Sense and Respond Logistics can provide these characteristics, the future of supply and logistics exists in this concept and its application.

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<sup>11</sup> U.S. Marine Corps Concepts and Programs, (2005), 107.

<sup>12</sup> USMC Concepts and Programs, 107.

<sup>13</sup> USMC Concepts and Programs, 107.



The concept of S&RL was developed by IBM's Steve Haeckel "as a managerial framework for large enterprises facing increasingly unpredictable, rapid and often discontinuous change."<sup>14</sup> S&RL uses the attributes pointed out earlier--adaptability, flexibility and responsiveness--to deal with ever present uncertainty. S&RL employs a "robust information technology and a highly flexible transportation system"<sup>15</sup> that makes it the perfect choice for overcoming the obstacles the Marine Corps will face within the evolving battle-space.

To make the S&RL system work, an arrangement of "intelligent agents" must be employed.<sup>16</sup> These agents are "sophisticated software codes that can review mission and situational data from sensors or humans and decide what products should be ordered, from what sources."<sup>17</sup> The agents will have the capability to "gather information from the environment measuring mechanical, thermal, biological, chemical, optical and magnetic phenomena" depending on the information desired.<sup>18</sup> This information is then stored for filtering at some later point, or broadcast within a network for immediate interpretation. For example,

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<sup>14</sup> Major Mark J. Menotti, USMC, Operations Research Management Science, *The Sense-and-Respond Enterprise, Why the U.S. Marine Corps should embrace the new paradigm*, <http://www.lionhrtpub.com/orms/orms-8-04/enterprise.html>, Accessed 19 October, 2005.

<sup>15</sup> USMC Concepts and Programs, 107.

<sup>16</sup> USMC Concepts and Programs, 107

<sup>17</sup> George Cahlink, "Sense-and-Respond Logistics," *Air Force Magazine*, November 2004, 48.

<sup>18</sup> Major Menotti, USMC.

...an agent might receive a sensor signal that a fighter is using up fuel and automatically order more. USAF's future aircraft, such as the F/A-22 and Joint Strike Fighter, are being designed with diagnostic equipment that can automatically send signals to mechanics and suppliers as parts wear out. At its most advanced, an agent for a combat unit might receive a human report about an emerging threat and then borrow ammunition from another unit not facing a threat.<sup>19</sup>

With this information, that gives the status of a vehicle, unit, or an individual troop, a commander can make a decision more quickly. This capability gives the commander the benefit, as Major Menotti says, of "knowing earlier,"<sup>20</sup> which "allows [him] to get an edge on [his] competition and to manage more effectively."<sup>21</sup> While this edge or advantage is parallel to the goals of maneuver warfare and the combined arms effect, in its simplest terms, knowing earlier really translates into the ability to decide earlier.

## **Conclusion**

As our enemies and the geometry of the battlefield change, so too should the systems that enable our strategic, operational, and tactical support capabilities. Because both mass-based logistics and just-in-time logistics have shortfalls that make them incompatible with the needs of the Marine Corps, Sense and Respond Logistics is the only tool that can

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<sup>19</sup> Cahlink, 48.

<sup>20</sup> Major Menotti, USMC.

<sup>21</sup> Major Menotti, USMC.

effectively support the Corps' expeditionary capability in the future. By giving commanders real-time information in regard to their assets, S&RL will revolutionize logistics capability. It will also help the commander in battle achieve his ultimate goals of accomplishing the mission and taking care of his troops.

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